

(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号

特開2000-250351

(P2000-250351A)

(43)公開日 平成12年9月14日(2000.9.14)

(51)Int.Cl.⁷

G 0 3 G 15/20

識別記号

1 0 6

1 0 2

F I

G 0 3 G 15/20

テームコード*(参考)

1 0 6

2 H 0 3 3

1 0 2

審査請求 未請求 請求項の数1 O L (全 5 頁)

(21)出願番号

特願平11-54635

(22)出願日

平成11年3月2日(1999.3.2)

(71)出願人 000207551

大日本スクリーン製造株式会社

京都府京都市上京区堀川通寺之内上る4丁

目天神北町1番地の1

(72)発明者 小賀野 晃

京都市上京区堀川通寺之内上る4丁目天神

北町1番地の1 大日本スクリーン製造株

式会社内

Fターム(参考) 2H033 AA16 BA08 BA16 BA20 BA21

BA22 BB12 BB28 CA22 CA37

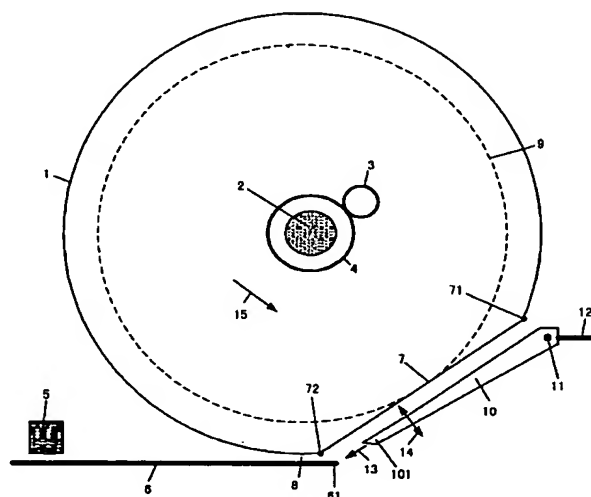
CA40

(54)【発明の名称】 電子写真装置の熱ローラ定着装置

(57)【要約】

【課題】電子写真装置の定着工程で用いられる熱ローラ定着器では、印刷紙が加熱圧縮された後に熱ローラ側面に密着するため、何らかの剥離機構が必要となる。しかし従来の剥離爪のみによる方式では、剥離爪が熱ローラ側面や印刷紙を引っ掻き、熱ローラの故障原因や印刷像の劣化原因となる。

【解決手段】そこで本発明では、剥離爪の内部に通気路を設け、印刷先端部が剥離爪に乗る直前に、剥離爪の先端から印刷紙先端部に向けて圧搾空気を発射する。これによって熱ローラに密着している印刷紙先端部を空気圧で剥離し、かつ一時的に浮き上がらせることにより、非接触で剥離爪にによって印刷紙先端部を分離させ、以降の熱ローラ回転により順次印刷紙の他の部分を熱ローラから剥離する機構を設けた。これにより剥離爪先端部による熱ローラ側面や印刷紙への引っ掻き傷をなくし、高速印刷で必要となる大サイズの定着ローラに対しても、スムーズな印刷紙剥離を可能とした。



【特許請求の範囲】

【請求項 1】電子写真装置の熱ローラ定着部において、搬送される印刷紙の先端を検出する印刷紙先端検出手段と、熱ローラ定着器の回転角度を検出する回転角度検出手段と、印刷紙先端位置に対応して回転する熱ローラ定着面に刻まれた複数の切りかけ溝と、空気路を内部に有する剥離爪と、前記剥離爪の先端を、前記切りかけ溝の位置に対応して前後に回転挿入する剥離爪回転制御手段と、前記検出された印刷紙の先端位置に対応して、前記剥離爪の内部の空気路から圧搾空気を供給する圧搾空気供給手段とを有することを特徴とする熱ローラ定着装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、電子写真複写機、電子写真プリンタ等の電子写真装置に用いられる熱ローラ定着器の印刷紙剥離機構に関する。

【0002】

【従来の技術】電子写真方式の複写機または印刷機においては、印刷用紙に転写したトナーを印刷紙上に永久に定着させるために、定着装置が組み込まれている。この定着装置は、ほとんどの場合トナーを熱融解して定着するため、熱効率と定着速度等を考慮して、装置サイズの比較的小型な熱ローラ定着器が採用されることが多い。この熱ローラ定着器は、トナーの付着した印刷用紙を 2 本のローラで挟み込み、そのローラのニップ部で用紙とトナーとに熱と圧力を加えてトナーを熔融し、用紙内部へ熔融したトナーを浸透させるものである。

【0003】また熱ローラ定着器は、その原理上、トナーを用紙に定着した後に、トナーと用紙をローラから剥離しなければならず、そのローラの表面にはゴムやテフロン樹脂など剥離性の良い材料を被覆してトナーの剥離性を向上させる必要がある。

【0004】熱ローラ定着器には、2 本のローラで加熱するもの（両面加熱）と片方のローラでのみ加熱するものがあるが、どちらのものも少なくともその一方のローラにはニップ形成層（耐熱ゴム）を持ち、またトナーと接するローラ表面にはトナーの剥離性を向上させるための剥離層（ニップ形成層を保護する意味もある）を設けることが多い。そしてローラの加熱には、ヒータとして、ハロゲンランプをローラの中空部に設置するのが一般的である。

【0005】一般的な熱ローラ定着器（片面加熱）の構造（断面図）の一例を図 3 に示す。図上 2 は熱源であるハロゲンランプを、30 は熱ローラの剥離層を、31 は熱ローラ本体（金属円筒）を、32 はニップ形成層（耐熱ゴム）を、33 は圧接側ローラ本体（金属円筒）をそれぞれ示す。

【0006】印刷紙 6 に転写された未定着トナー像 34 は、熱ローラ定着器の 2 本のローラに加重をかけること

で形成されるニップ部 8 へと送られ、一定の時間、加熱、加圧された後、熱ローラから剥離されてニップ部から排出される。ここで、ニップ部から排出される印刷紙を定着ローラから剥離しようとすれば、印刷用紙は熱によって融解したトナーの粘性のために定着ローラ表面に付着する。従って何らかの機械的な力によって定着ローラから印刷紙を引き剥がす必要がある。

【0007】

【発明が解決しようとする課題】印刷速度が低く、定着ローラの直径が比較的小さな定着器においては、印刷紙の弾性等のために、トナーの粘性を低下させたり、定着ローラの剥離層または定着ローラ表面に剥離剤（シリコンオイル）を塗布することによって、機械的な剥離機構なしでも印刷用紙を定着ローラから剥離することができる。しかし印刷速度が高くなればなるほど定着ローラの直径を大きくする必要が生じ、加えて印刷紙の引き剥がしのための時間が短くなること等の理由から、トナーの粘性の影響が相対的に大きくなってしまう。その結果、機械的剥離機構なしでは、印刷紙を定着ローラから引き剥がすことは難しくなる。

【0008】この場合通常図 3 に示す剥離爪 10 により印刷紙先端部を啞え（引っかけて乗せ）ること等による機械的剥離機構を設けるが、かかる剥離爪の先端部を定着ローラに接触させると、高速印刷になればなるほど定着ローラ表面の剥離層を傷つける度合いが高まる。これは印刷紙表面のトナー画像についても剥離爪による傷の発生度合いが高まることをも意味している。

【0009】従って熱ローラ定着器は、比較的小型で高熱効率かつ高速印刷にも対応しやすい性質を持っているものの、実際に高速で大型の印刷機用の熱ローラを製作するに当たっては幾つかの課題があった。その課題の一つは、印刷紙の定着ローラからの剥離であり、印刷用紙の剥離は定着ローラが大型になればなるほど、また印刷速度が高速になればなるほど困難になってくる。

【0010】本発明は、このような熱ローラ定着器の従来の課題を考慮し、大型かつ高速の電子写真方式の複写機または印刷機に適合した熱ローラ定着器を提供することを目的とする。

【0011】

【課題を解決するための手段および効果】かかる課題を解決する為に、本発明は、電子写真装置の熱ローラ定着部において、搬送される印刷紙の先端を検出する印刷紙先端検出手段と、熱ローラ定着器の回転角度を検出する回転角度検出手段と、印刷紙先端位置に対応して回転する熱ローラ定着面に刻まれた複数の切りかけ溝と、空気路を内部に有する剥離爪と、前記剥離爪の先端を前記切りかけ溝の位置に対応して前後に回転挿入する剥離爪回転制御手段と、前記検出された印刷紙の先端位置に対応して前記剥離爪の内部の空気路から圧搾空気を供給する圧搾空気供給手段とを有する。

10

20

30

40

50

【0012】上記発明構成により、高速印刷に対しても機械的剥離能力を十分維持すると共に、定着ローラ表面や印刷紙上のトナー画像に剥離爪が接触する可能性を大幅に削減するようにした。加えてこれらの改善により、高速印刷に対応するため熱ローラを大型化し、かつ印刷紙の定着ローラ表面からの剥離速度が速くなくても、確実に印刷紙を定着ローラから剥離することができる。更に印刷紙先端部が剥離爪先端に近づいた時点で圧搾空気を吹き付けて印刷紙先端部を剥離させることから、定着ローラ表面に剥離爪が当たることによる定着ローラ表面の剥離層の劣化や、剥離爪が印刷用紙上のトナー画像を傷つけることによる画質の劣化を大幅に改善することが可能になった。

【0013】

【発明の実施の形態】＜構成の概要＞図1および図2に本発明の最適な実施の形態に係る構成図を示す。ともに図3で例示した片面加熱タイプの熱ローラ定着器における実施の形態を示し、本発明にかかる構成部分を中心に図示した。

【0014】図2は、本発明にかかる複数の切りかけ溝7と剥離爪10が、熱ローラ側面上にどの様に配置されるかを模式的に示した斜視図であり、構造上の理解を容易にするために剥離爪10は意図的に熱ローラ側面から離れた状態で表示している（剥離爪10のより正確な配置は図1に示している）。また図上20は剥離爪回転制御部を示し、熱ローラ1の回転による切りかけ溝7の移動に対応して、回転軸11を制御する機能を有する。更に21は圧搾空気供給部であり、後述する印刷紙先端部（図1の61）と前記剥離爪10との位置関係に対応して、剥離爪10の内部に形成された空気路を通じて圧搾空気を供給する。その為の圧搾空気供給ホースが12で示されている。

【0015】図2の破線16に沿った断面に、印刷紙6および印刷紙先端検出部5を加えた断面構造図を図1に示す。図上1は円筒形状の熱ローラ、2は熱源であるハロゲンランプを示す。熱ローラ1は矢印15の方向に回転し、その回転角は熱ローラの回転軸に取り付けられたエンコーダ駆動ギア4を通じてロータリーエンコーダ3により正確に検出され、これらが熱ローラ回転角検出部を構成している。また熱ローラ1には、同心円9で示す深さを有する複数の切りかけ溝7が形成され、この位置に対応して剥離爪10が設置されている。剥離爪10は、回転軸11により矢印14の方向に往復回転運動し、剥離爪10の内部は圧搾空気供給ホース12から供給される圧搾空気の通路（空気路）が形成されており、印刷紙6の先端部61の動きに呼応して圧搾空気を矢印13の方向に発する。

【0016】＜詳細動作の説明＞以下図1に基づいて、本発明にかかる実施の形態の詳細な動作について説明する。

【0017】トナー像の転写された印刷紙は、図示しない搬送装置により、印刷紙先端検出部5により印刷紙6の先端61が検出されるまで搬送され、熱ローラの切りかけ溝の先端部71が所定位置にくるまで待つ。この位置は予め設定された回転角をロータリーエンコーダ3が検出することにより検知され、これに呼応して印刷紙の搬送装置は、印刷紙6を熱ローラ1へと送り込む。

【0018】印刷紙6が熱ローラ1に向けて送り込まれる間に、剥離爪10は、切りかけ溝7から離れた位置関係においてはその先端部101が熱ローラ1の側面に接触しない位置まで後退していたものが、切りかけ溝7の先端部71が接近した時点で、その先端部101を切りかけ溝7の内部に入り込む位置に回転移動させる。この回転移動は、熱ローラ1の回転に同期して、図2の剥離爪回転制御部20の制御のもとで回転軸11を介して剥離爪回転制御部20により行われる。

【0019】そして搬送されてきた印刷紙6は熱ローラ1のニップ部8により挟み込まれ、熱と圧力によってトナー像が印刷紙6に定着される。図1は丁度この時点の状態を示している。即ち印刷紙6の先端部61がニップ部8を通過した直後に、熱ローラ1に設けられた切りかけ溝7の他端72がくる様に、印刷紙6が搬送されるとともに、丁度図1の状態になる様に剥離爪10が熱ローラ1の切りかけ溝7の中に入り込むように、剥離爪回転制御部20により制御される。

【0020】次にこの状態で、剥離爪10の先端部101から印刷紙6の先端部61に向かって、矢印13の方向に圧搾空気が発射される。この圧搾空気は、圧搾空気供給部21から延びた圧搾空気供給ホース12から、剥離爪10の他端に供給され、剥離爪10の内部に形成された空気路を通して剥離爪10の先端部101供給される。

【0021】圧搾空気が発射されると、ニップ部8で加熱圧着されたために熱ローラ1の表面に密着している印刷紙6の先端部61が、その空気圧により剥がれ、丁度持ち上がったタイミングに合わせて、剥離爪10の先端部101に銜え込むように（乗るように）剥離爪10の回転位置が制御される。これによって剥離爪10の先端部101が熱ローラ1の表面や印刷紙の画像形成面に引っ掻き傷を形成することなく、印刷紙6の先端部61が剥離爪10の先端部101によってローラより分離されることとなる。以降、剥離爪10を熱ローラ1の回転に対応して徐々に外側に回転させ、剥離爪10が切りかけ溝7から徐々に出る方向に制御することにより、その後の熱ローラの回転により自ずと印刷紙6は剥離爪10の下方へと剥離される。

【0022】以上の機構により、大型、高速の熱ローラ定着器において、用紙の剥離速度が高くなっても、確実に用紙先端を定着ローラから剥離することができ、かつ、定着ローラ表面や印刷用紙上のトナー画像に傷を付

ける可能性を大幅に削減することが可能となった。

【0023】また、用紙先端部を定着ローラの溝の上に挟み込むことについては用紙先端の検出センサーと定着ローラに設けられたエンコーダ並びにこれらの信号によって用紙の搬送速度を制御する用紙搬送装置によって動作の確実性を確保することができる。

【図面の簡単な説明】

【図1】本発明の実施の形態である熱ローラ定着器の剥離機構を示す図である。

【図2】本発明の実施の形態である熱ローラ定着器の斜視構成を示す図である。

【図3】一般的な熱ローラ定着器（片面加熱タイプ）の断面構成を示す図である。

【符号の説明】

- 1 熱ローラ
- 2 加熱用のハロゲンランプ
- 3 ロータリーエンコーダ
- 4 エンコーダ駆動ギア
- 5 印刷紙先端検出部
- 6 印刷紙
- 7 切りかけ溝

8 ニップ部

9 切りかけ溝の深さを示す同心円

10 剥離爪

11 剥離爪回転軸

12 圧搾空気供給ホース

13 圧搾空気の発射方向を示す矢印

14 剥離爪先端部の回転方向を示す矢印

15 熱ローラの回転方向を示す矢印

16 図1の切断面

20 剥離爪回転制御部

21 圧搾空気供給部

30 熱ローラの剥離層

31 熱ローラ本体（金属円筒）

32 ニップ形成層（耐熱ゴム）

33 圧接側ローラ本体（金属円筒）

34 未定着トナー像

35 定着トナー像

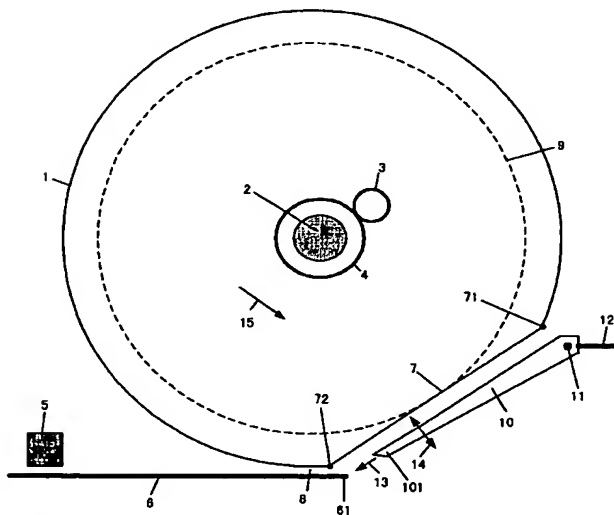
61 印刷紙先端部

71 切りかけ溝の一端

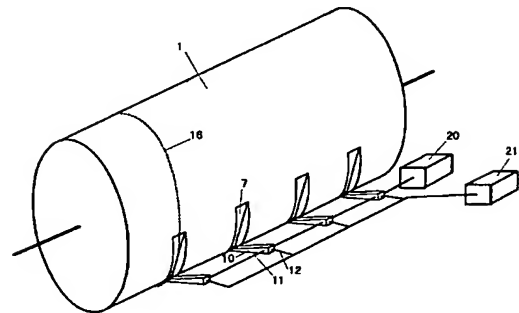
72 切りかけ溝の他端

101 剥離爪の先端部

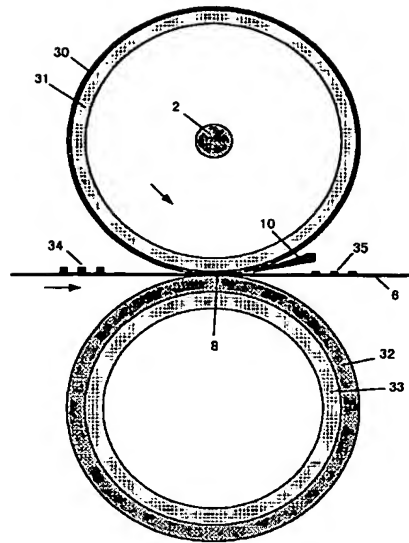
【図1】



【図2】



【図3】



PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-250351

(43)Date of publication of application : 14.09.2000

(51)Int.Cl.

G03G 15/20

(21)Application number : 11-054635

(71)Applicant : DAINIPPON SCREEN MFG CO LTD

(22)Date of filing : 02.03.1999

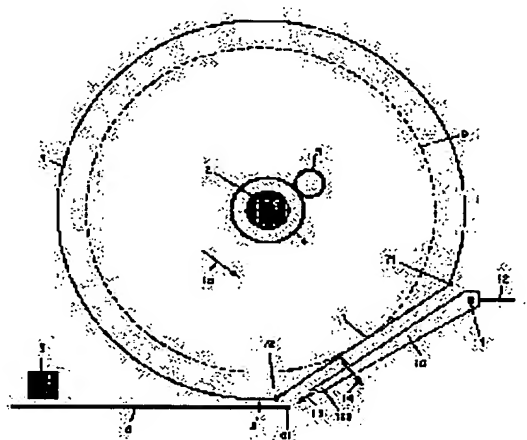
(72)Inventor : OGANO AKIRA

(54) HEAT ROLLER FIXING DEVICE FOR ELECTROPHOTOGRAPHIC DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To surely peel the leading end of a paper from a fixing roller, besides, to prevent a fixing roller surface and a toner image on a printing paper from being scratched by providing a cutout groove formed on the fixing surface of a heat roller and a peeling pawl equipped with an air path, inserting the leading end of the peeling pawl in the position of the cutout groove with rotation and supplying a compressed air through the air path of the peeling pawl at the printing paper leading end position.

SOLUTION: The printing paper 6 is carried until the leading end of the printing paper 6 is detected by a printing paper leading end detecting part 5, and then, held until the leading end part 71 of the cutout groove of the heat roller reaches a prescribed position. While the printing paper 6 is fed toward the heat roller 1, the peeling pawl 10 is moved with rotation so that the leading end part 101 may get into the cutout groove 7 at the point of time when the leading end part 71 of the cutout groove 7 comes close to the pawl 10. The device is controlled so that the peeling pawl 10 may get into the cutout groove 7 of the heat roller 1 in accordance with the feeding of the printing paper 6. The compressed air is jetted 13 from the leading end part 101 of the peeling pawl 10 toward the leading end part 61 of the printing paper 6 in this state.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision]

of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-250351
(43)Date of publication of application : 14.09.2000

51)Int.Cl. G03G 15/20

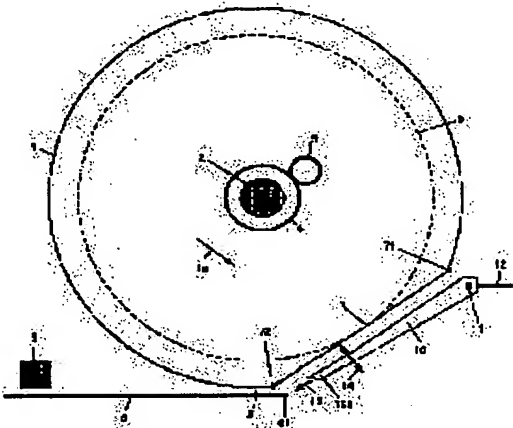
21)Application number : 11-054635 (71)Applicant : DAINIPPON SCREEN MFG CO LTD
22)Date of filing : 02.03.1999 (72)Inventor : OGANO AKIRA

54) HEAT ROLLER FIXING DEVICE FOR ELECTROPHOTOGRAPHIC DEVICE

57)Abstract:

PROBLEM TO BE SOLVED: To surely peel the leading end of a paper from a fixing roller, besides, to prevent a fixing roller surface and a toner image on a printing paper from being scratched by providing a cutout groove formed on the fixing surface of a heat roller and a peeling pawl equipped with an air path, inserting the leading end of the peeling pawl in the position of the cutout groove with rotation and supplying a compressed air through the air path of the peeling pawl at the printing paper leading end position.

SOLUTION: The printing paper 6 is carried until the leading end of the printing paper 6 is detected by a printing paper leading end detecting part 3, and then, held until the leading end part 71 of the cutout groove of the heat roller reaches a prescribed position. While the printing paper 6 is fed toward the heat roller 1, the peeling pawl 10 is moved with rotation so that the leading end part 101 may get into the cutout groove 7 at the point of time when the leading end part 71 of the cutout groove 7 comes close to the pawl 10. The device is controlled so that the peeling pawl 10 may get into the cutout groove 7 of the heat roller 1 in accordance with the feeding of the printing paper 6. The compressed air is jetted 13 from the leading end part 101 of the peeling pawl 10 toward the leading end part 61 of the printing paper 6 in this state.



LEGAL STATUS

Date of request for examination]
Date of sending the examiner's decision of rejection]
Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
Date of final disposal for application]
Patent number]
Date of registration]
Number of appeal against examiner's decision of rejection]
Date of requesting appeal against examiner's decision of rejection]
Date of extinction of right]

NOTICES *

Japan Patent Office is not responsible for any
damages caused by the use of this translation.

This document has been translated by computer. So the translation may not reflect the original precisely.
**** shows the word which can not be translated.
In the drawings, any words are not translated.

LAIMS

Claim(s)]
Claim 1] The heat roller fixing section of the electrophotography equipment characterized by providing the following
printing paper nose-of-cam detection means to detect the nose of cam of the printing paper conveyed An angle-of-
rotation detection means to detect angle of rotation of a heat roller fixing assembly The plurality minced by the heat
roller fixing side rotated corresponding to a printing paper nose-of-cam position is cutting, and it is a slot. The ablation
presser foot stitch tongue which has an air conduit inside, the ablation presser-foot-stitch-tongue roll control means
which is cutting the nose of cam of the aforementioned ablation presser foot stitch tongue the account of before, and
carries out rotation insertion in order corresponding to the position of a slot, and a compressed-air supply means to
supply a compressed air from the air conduit inside the aforementioned ablation presser foot stitch tongue
corresponding to the nose-of-cam position of the printing paper by which detection was carried out [aforementioned]

[translation done.]

NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

This document has been translated by computer. So the translation may not reflect the original precisely.

**** shows the word which can not be translated.

In the drawings, any words are not translated.

DETAILED DESCRIPTION

Detailed Description of the Invention]

0001]

Industrial Application] this invention relates to the printing paper ablation mechanism of the heat roller fixing assembly used for electrophotography equipments, such as an electrophotography copying machine and an electrophotographic printer.

0002]

Description of the Prior Art] In the copying machine or printing machine of an electrophotography method, in order to fix eternally the toner imprinted to the print sheet on printing paper, fixing equipment is incorporated. Since this fixing equipment carries out heat dissolution of the toner in almost all cases and is established, in consideration of thermal efficiency, fixing speed, etc., the comparatively small heat roller fixing assembly of equipment size is adopted in many cases. This heat roller fixing assembly makes the toner which put the print sheet to which the toner adhered with two rollers, applied heat and the pressure to the form and the toner in the nip section of the roller, fused the toner, and was used inside the form permeate.

0003] Moreover, on the principle, after a heat roller fixing assembly is fixed to a form in a toner, it must exfoliate a toner and a form from a roller, needs to cover detachability good material, such as rubber and Teflon resin, in the front face of the roller, and needs to raise the detachability of a toner.

0004] Although there are what is heated with two rollers (double-sided heating), and a thing to heat only with one of the two's roller in a heat roller fixing assembly, the stratum disjunctum (there is a meaning which protects a nip cambium) for raising the detachability of a toner is prepared in the roller front face which both of the things have a nip cambium (heat-resistant rubber) in the roller of one of these at least, and touches a toner in many cases. And it is common to heating of a roller to install a halogen lamp in the centrum of a roller as a heater.

0005] An example of the structure (cross section) of a general heat roller fixing assembly (one side heating) is shown in drawing 3. the halogen lamp whose drawing top 2 is a heat source -- 30 -- the stratum disjunctum of a heat roller -- 31, 32 shows a nip cambium (heat-resistant rubber), and 33 shows the main part of a pressure-welding side roller (metal cylinder) for the main part of a heat roller (metal cylinder), respectively

0006] The non-established toner image 34 imprinted by printing paper 6 is sent to the nip section 8 formed by applying a load to two rollers of a heat roller fixing assembly, fixed time, after being heated and pressurized, exfoliates from a heat roller and is discharged from the nip section. Here, if it is going to exfoliate the printing paper discharged from the nip section from a fixing roller, a print sheet will adhere to a fixing roller front face for the viscosity of the toner dissolved with heat. Therefore, a certain mechanical force needs to tear off printing paper from a fixing roller.

0007]

Problem(s) to be Solved by the Invention] A print speed is low, and by reducing the viscosity of a toner or applying a mover (silicone oil) to the stratum disjunctum or fixing roller front face of a fixing roller in a fixing assembly with the comparatively small diameter of a fixing roller, for the elasticity of printing paper etc., even if he has no mechanical ablation mechanism, a print sheet can be exfoliated from a fixing roller. However, as a print speed becomes high, it will be necessary to enlarge the diameter of a fixing roller, in addition, printing paper will tear off, and the influence of viscous of the reason of a bird clapper etc. to a toner with the short time of a ** sake will become larger relatively. Consequently, if you have no mechanical ablation mechanism, it becomes difficult to tear off printing paper from a fixing roller.

0008] In this case, although the mechanical ablation mechanism according a printing paper point to **** (hooking and putting) ***** etc. is established with the ablation presser foot stitch tongue 10 usually shown in drawing 3, if the point of this ablation presser foot stitch tongue is contacted on a fixing roller, the more it will become high-speed printing, the more the degree which damages the stratum disjunctum of a fixing roller front face increases. This also

means that the generating degree of the blemish by the ablation presser foot stitch tongue increases also about the toner picture on the front face of printing paper.

009] Therefore, although the heat roller fixing assembly was comparatively small and had the property to be easy to respond also to high temperature efficiency and high-speed printing, in case it actually manufactured the large-sized heat roller for printing machines at high speed, it had some technical problems. One of the technical problem of the is ablation from the fixing roller of printing paper, and ablation of a print sheet becomes more difficult, so that a fixing roller becomes large-sized, and as a print speed becomes high-speed.

010] this invention aims at offering the heat roller fixing assembly which suited the copying machine or printing machine of a large-sized and high-speed electrophotography method in consideration of the conventional technical problem of such a heat roller fixing assembly.

011]

A The means for solving a technical problem and an effect] In order to solve this technical problem, this invention is at in the heat roller fixing section of electrophotography equipment. A printing paper nose-of-cam detection means to detect the nose of cam of the printing paper conveyed, and an angle-of-rotation detection means to detect angle of rotation of a heat roller fixing assembly, The plurality minced by the heat roller fixing side rotated corresponding to a printing paper nose-of-cam position is cutting. A slot, It has the ablation presser foot stitch tongue which has an air conduit inside, the ablation presser-foot-stitch-tongue roll control means which is cutting the nose of cam of the forementioned ablation presser foot stitch tongue the account of before, and carries out rotation insertion in order corresponding to the position of a slot, and a compressed-air supply means to supply a compressed air from the air conduit inside the aforementioned ablation presser foot stitch tongue corresponding to the nose-of-cam position of the printing paper by which detection was carried out [aforementioned].

012] By the above-mentioned invention composition, while maintaining mechanical ablation capacity enough also to high-speed printing, possibility that an ablation presser foot stitch tongue would contact the toner picture on a fixing roller front face or printing paper was cut down sharply. In addition, since it corresponds to high-speed printing, even if enlarges a heat roller and the ablation speed from the fixing roller front face of printing paper becomes quick by these improvements, printing paper can be certainly exfoliated from a fixing roller. Furthermore, since a compressed air is sprayed and the printing paper point was made to exfoliate when the printing paper point approached the ablation ptoe edge, it became possible to improve sharply degradation of the stratum disjunctum of the fixing roller front face y an ablation presser foot stitch tongue hitting a fixing roller front face, and degradation of the quality of image by an ablation presser foot stitch tongue damaging the toner picture on a print sheet.

013]

Embodiments of the Invention] The block diagram which starts the gestalt of the optimal operation of this invention at outline of composition> drawing 1 and drawing 2 is shown. The gestalt of the operation in the heat roller fixing assembly of the one side heating type illustrated by both drawing 3 was shown, and it illustrated focusing on the component concerning this invention.

014] Drawing 2 is the perspective diagram having shown typically how the plurality concerning this invention would at and a slot 7 and the ablation presser foot stitch tongue 10 would be arranged on the heat roller side, and in order to take an understanding on structure easy, the ablation presser foot stitch tongue 10 is displayed in the state where it separated from the heat roller side intentionally (more exact arrangement of the ablation presser foot stitch tongue 10 is shown in drawing 1). Moreover, drawing top 20 shows the ablation presser-foot-stitch-tongue roll control section, and as the function which has been based on rotation of the heat roller 1 and controls the axis of rotation 11 corresponding movement of a slot 7. Further 21 is a compressed-air feed zone, and supplies a compressed air through the air conduit formed in the interior of the ablation presser foot stitch tongue 10 corresponding to the physical relationship of the printing paper point (61 of drawing 1) and the aforementioned ablation presser foot stitch tongue 10 which are mentioned later. The compressed-air supply hose for it is shown by 12.

015] Cross-section structural drawing which added printing paper 6 and the printing paper nose-of-cam detecting element 5 to the cross section which met the dashed line 16 of drawing 2 is shown in drawing 1 . The halogen lamp whose 2 drawing top 1 is a cylindrical shape-like heat roller, and is a heat source is shown. The heat roller 1 rotates in the direction of an arrow 15, the angle of rotation is correctly detected by the rotary encoder 3 through the encoder drive gear 4 attached in the axis of rotation of a heat roller, and these constitute the heat roller angle-of-rotation detecting element. Moreover, the plurality which has the depth shown in the heat roller 1 by the concentric circle 9 is cutting, a slot 7 is formed, and the ablation presser foot stitch tongue 10 is installed corresponding to this position. The ablation presser foot stitch tongue 10 carries out both-way rotation in the direction of an arrow 14 by the axis of rotation 11, and the path (air conduit) of a compressed air to which the interior of the ablation presser foot stitch tongue 10 is supplied from the compressed-air supply hose 12 is formed, and emits a compressed air in the direction of an

row 13 in response to the movement of the point 61 of printing paper 6.

016] Based on below <explanation of detailed operation> drawing 1, detailed operation of the gestalt of operation concerning this invention is explained.

017] It waits for the printing paper with which the toner image was imprinted until it is conveyed until the nose of am 61 of printing paper 6 is detected by the printing paper nose-of-cam detecting element 5, and a heat roller is cutting and the point 71 of a slot comes to a predetermined position by the transport device which is not illustrated. This position is detected when a rotary encoder 3 detects the angle of rotation set up beforehand, and in response to this, the transport device of printing paper sends printing paper 6 into the heat roller 1.

018] The position which is cutting the point 101 when what was retreating to the position where the point 101 does not contact the side of the heat roller 1 in the physical relationship which was turning off the ablation presser foot stitch tongue 10, and is distant from a slot 7 is cutting and the point 71 of a slot 7 approaches while printing paper 6 is sent in towards the heat roller 1, and enters the interior of a slot 7 is rotated. This rotation is performed by the ablation presser-foot-stitch-tongue roll control section 20 through the axis of rotation 11 synchronizing with rotation of the heat roller 1 under control of the ablation presser-foot-stitch-tongue roll control section 20 of drawing 2.

019] And the conveyed printing paper 6 is put by the nip section 8 of the heat roller 1, and printing paper 6 is fixed to toner image with heat and a pressure. Drawing 1 shows the state at this time exactly. That is, while printing paper 6 is conveyed so that it might be prepared in the heat roller 1 immediately after the point 61 of printing paper 6 passed the nip section 8, and it may cut and the other end 72 of a slot 7 may come, it is controlled by the ablation presser-foot-stitch-tongue roll control section 20 so that it may be in the state of drawing 1 exactly, and the heat roller 1 is cutting and the ablation presser foot stitch tongue 10 enters into a slot 7.

020] Next, in this state, a compressed air is discharged in the direction of an arrow 13 toward the point 61 of printing paper 6 from the point 101 of the ablation presser foot stitch tongue 10. This compressed air is supplied to the other end of the ablation presser foot stitch tongue 10 from the compressed-air supply hose 12 prolonged from the compressed-air feed zone 21, and the ablation presser foot stitch tongue 10 is supplied point 101 through the air conduit formed in the interior of the ablation presser foot stitch tongue 10.

021] the timing to which the point 61 of the printing paper 6 stuck to the front face of the heat roller 1 since heating sticking by pressure was carried out in the nip section 8 when the compressed air was discharged separated by the pneumatic pressure, and was raised exactly -- doubling -- the point 101 of the ablation presser foot stitch tongue 10 -- ***** -- the rotation position of the ablation presser foot stitch tongue 10 is controlled like (it rides -- as) The point 1 of printing paper 6 will be separated from a roller by the point 101 of the ablation presser foot stitch tongue 10, without the point 101 of the ablation presser foot stitch tongue 10 forming a scratch in the front face of the heat roller, or the image formation side of printing paper by this. Henceforth, printing paper 6 exfoliates under the ablation presser foot stitch tongue 10 naturally by rotation of a subsequent heat roller by controlling in the direction which the ablation presser foot stitch tongue 10 is gradually rotated outside corresponding to rotation of the heat roller 1, and the ablation presser foot stitch tongue 10 is cutting, and comes from a slot 7 gradually.

022] It became possible to cut down sharply possibility of being able to exfoliate a form nose of cam from a fixing roller certainly, and attaching a blemish to the toner picture on a fixing roller front face or a print sheet in a large-sized and high-speed heat roller fixing assembly according to the above mechanism even if the ablation speed of a form becomes high.

023] Moreover, about putting a form point on the slot of a fixing roller, certainty of operation is securable with the form transport device which controls the bearer rate of a form by the encoders formed in the detection sensor and fixing roller at the nose of cam of a form, and these signals.

[translation done.]

NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

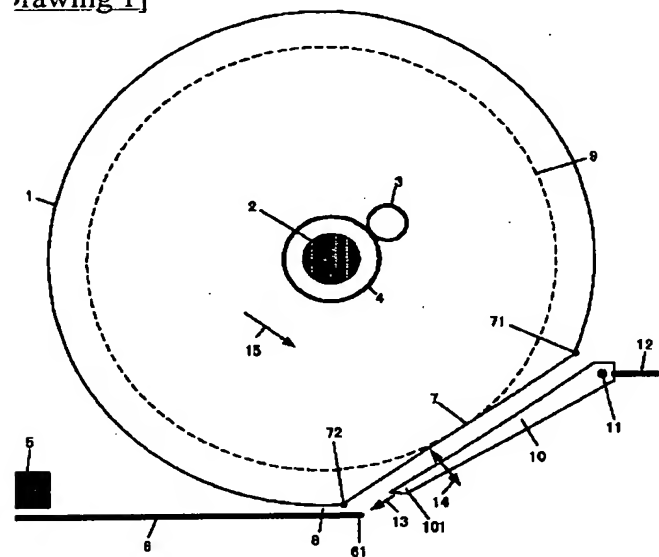
This document has been translated by computer. So the translation may not reflect the original precisely.

**** shows the word which can not be translated.

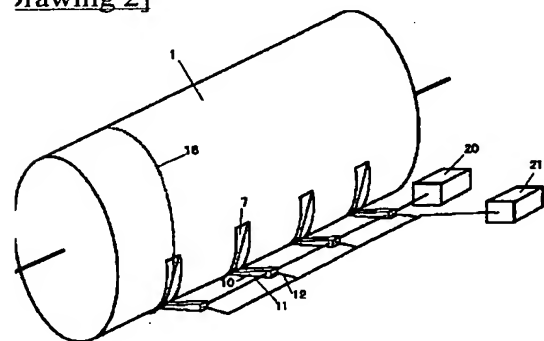
In the drawings, any words are not translated.

DRAWINGS

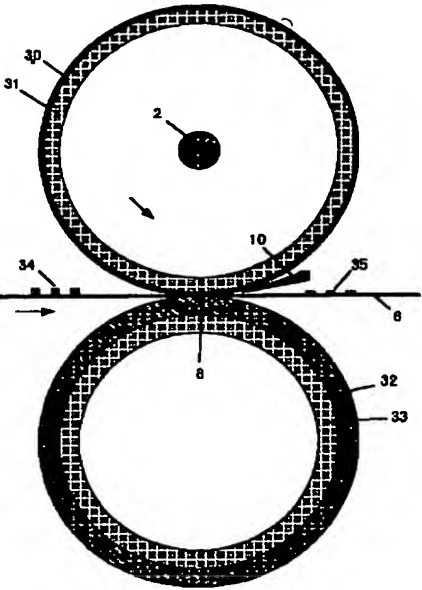
Drawing 1]



Drawing 2]



Drawing 3]



[ranslation done.]